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The CATTARAUGUS COUNTY
HEALTH DEMONSTRATION CONTINUES

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THE Cattaraugus County Health Demonstration, which began early in 1923 with the appointment of the Cattaraugus County Board of Health, completed its fifth year of operation on December 31, 1927. A resolution, adopted unanimously by the Board of Supervisors on November 22, 1927, appropriated funds to finance, without modification, the activities which the County Board of Health had included in its program and budget for the County's public health work in 1928. The total amount appropriated was \$56,000, which was the amount of the appropriation for similar work in 1927. This action of the Supervisors indicated a desire on the part of the people of the County to have their public

health work continued on its existing basis. This desire was further evidenced by passage of formal resolutions by the County Board of Health and some forty other local bodies, official and voluntary, requesting the Milbank Memorial Fund to continue its cooperation with the Board in the Cattaraugus County Health Demonstration.

During the five-year demonstration period Cattaraugus County has witnessed a reduction of approximately one-third in the tuberculosis death rate, and of nearly one-fifth in the infant mortality rate. These reductions are the more striking because

this County has not previously shared in the decline of deaths from these causes which the past two decades have witnessed in other sections of the country. Both of these causes of mortality are regarded by public health experts as sensitive indices of environmental factors. Since close observation has shown that the only important factor in the Cattaraugus environment which has changed during this period is the institution of this intensive public health work, it is difficult to escape the conclusion that there is a direct and convincing relationship between this work and the reduction in sickness

IN these first pages, Edward W. Sheldon, president of its Board of Directors, announces that the Milbank Memorial Fund will continue its cooperation with the County Board of Health in the development of the public health program in Cattaraugus County, New York.

In the second article in this issue Dorothy Gerard Wiehl, assistant statistician of the United States Public Health Service, has presented the preliminary results of a recent investigation to discover the significance of the recent decline in the Cattaraugus infant mortality rate.

and death rates which has taken place in the County.

Practical contributions of the demonstration to date have been the establishment in Cattaraugus of the first county

DURING the past five years Cattaraugus County has witnessed a reduction of approximately one-fifth in the infant mortality rate and one-third in the tuberculosis death rate. These reductions are more striking because this county has not shared in the decline of deaths from these causes which the past two decades have seen in other sections of the country. (The significance of the decline in the tuberculosis death rate will be the subject of an article by Edgar Sydenstricker in the April *Quarterly Bulletin*.

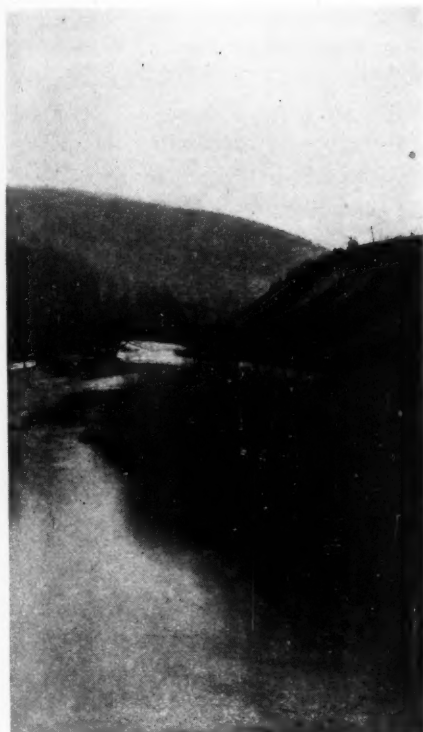
health department and the first county-wide school health unit in New York State. In its five years of demonstration, the County has witnessed its and the State's first half-decade of experience with the administration of public health on a county-wide basis. During the past year an objection was made by the County Medical Society to the program and budget of the County Health Department. This grew

apparently out of concern on the part of some members of the local medical profession regarding the possible effect on medical practice of further development of public health work, particularly with lay groups taking an active part in the leadership—a questioning, it should be added, which is not shared by all of the physicians of the County, nor by the medical profession generally. At no time, however, has anyone in Cattaraugus questioned the need for continuance of the County Health Department. The necessity of this has apparently been successfully demonstrated to all groups in the County.

Under the leadership of the County Board of Health, the



physicians of the County have given whole-hearted cooperation toward the development of the Department. They have helped materially in building up an effective county program for the prevention and control of tuberculosis. They have participated in instituting an active program for the protection of the health of pregnant women, of babies, and of younger children. Their increasing use of the County Laboratory has resulted in the development of a small local institution to a point where it is now making between seven and eight thousand examinations a year. Through participation



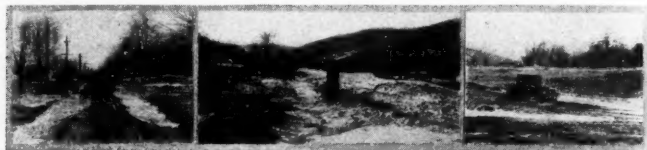
in the course of their private practice and otherwise in the school health program the physicians have aided in the correction of over half of the physical defects found among rural school children during medical examinations made in the first four years of the demonstration. Their cooperation in a campaign, inaugurated by the Health Board, resulted in the immunization against diphtheria of approximately half of the children under

ten years of age living in Cattaraugus County.

WHILE establishment of the County Health Department through such cooperation of local medical and lay groups has been the immediate practical outcome of the demonstration, and one toward which the project has at all times addressed itself, there was other experience, which those who shared in shaping the project hoped that it might evolve. The undertaking was seen as an opportunity to demonstrate, by cooperation with the County in setting up a county-wide public health program, "whether by intensive

application of known health measures, the extent of sickness in a typically rural community can be further and materially diminished and mortality rates further and substantially reduced, and whether or not such practical results can be achieved in a relatively short period of time and at a per capita cost which communities will be willing to bear."

The five demonstration years have not only demonstrated to the people of Cattaraugus County the advantage of the County as a unit for public health administration but have yielded experience which it is believed has a definite bearing on these more fundamental considerations. Much of this has been recorded; information about it has been disseminated, and some of it has been applied elsewhere. The tasks involved in observing this experience, however, and in making it available, in as definite terms as possible and from a reasonably dispassionate point of view, are not easy. They require time. The Cattaraugus County Board of Health and the Milbank Fund's Technical Board have concluded, therefore, that the ends of the Cattaraugus County Health Demonstration will be served if the County Health Board's program were continued for a time, on substantially the same scale as in 1927. The appropriative action of the County Board of Supervisors, supplemented by resolutions of many local public and voluntary groups, indicates that this belief is held generally in Cattaraugus County. At the request, therefore, of the County Health Board, and upon recommendation of the Fund's Technical Board, the Board of Directors on December 19, 1927, authorized continued participation of the Fund in the demonstration for the year 1928.



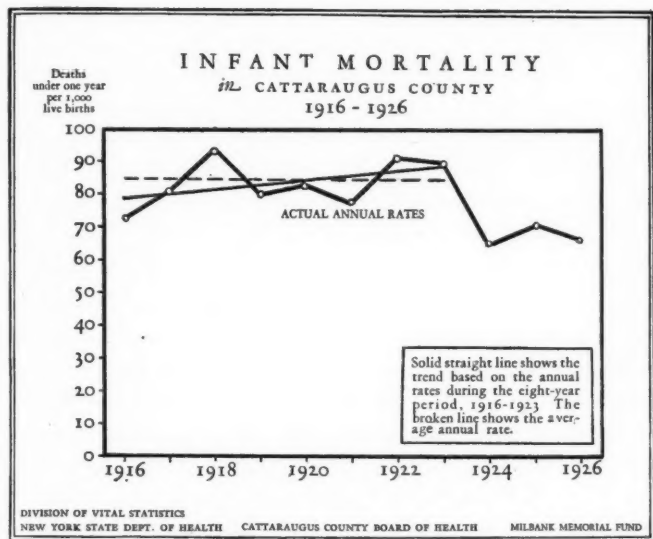


FIG. 1

INFANT MORTALITY IN CATTARAUGUS COUNTY*

by DOROTHY GERARD WIEHL

Assistant Statistician, United States Public Health Service

RECENT years have recorded a sudden decline in Cattaraugus County in the mortality of infants under one year of age. During the three years 1924, 1925 and 1926, the infant mortality rates there were lower than in any of the previous eight years, the decline marking a definite departure from an upward trend which had been in progress from 1916 to 1923. Study of the causes to which these infant deaths had been attributed, shows that the three-year decline was due principally to a falling off in the number of deaths from diseases generally designated as preventable, that is, from communicable diseases, from gastro-intestinal diseases and from respiratory diseases. Comparisons have brought out that, during the years 1924 and 1925, the infant mortality

*From the Statistical Office of the Milbank Memorial Fund.

from these preventable causes was higher in each of four other New York counties than it was in Cattaraugus.

That the mortality among children under one year of age in Cattaraugus showed an improvement in the years 1924, 1925 and 1926 over the preceding eight years is obvious from the annual rates* shown in Table 1 and Fig. 1. The rate in each of these years was lower than the rate for any of the previous eight years and it follows that the average rate for the three years was much lower than the average for the eight years.

The significance of this improvement can be judged from (1) comparison with the changes in the annual mortality in the County in previous years to determine whether such a decline might have been expected and (2) comparison with other areas to determine whether or not this decline has been common to other rural sections of the State and nation.

Comparison of Current with Earlier Years

In the first comparison, it is necessary to decide on the basis of eight years' experience in Cattaraugus County what might reasonably have been expected in the next few years if the factors affecting infant mortality in the County had continued unchanged. The shortness of the period and the wide variation in the rates for these eight years make it very difficult to determine any real trend in the mortality in the County. The actual rates plotted in Fig. 1 suggest a tendency for the mortality to increase from 1916 to 1923, and a straight line fitted to the eight points by the method of least squares† has a decided upward slope, as shown in the chart. It is quite evident that the slope of this trend line is influenced greatly by the low rate in 1916, which was offset to some extent by the high rate in 1918, and by the two high rates in 1922 and 1923. In some years the actual rates do not

*Throughout this study, the rates are based on infant deaths and births exclusive of Indians.

†The line was fitted to the eight annual rates by the equation $y = a + bx$.

Table 1. Deaths of children under one year of age, per 1,000 live births (infant mortality) in Cattaraugus County, 1916-1926.*

NUMBER AND RATE	YEAR										
	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Death rate per 1,000 live births	73.0	81.6	94.7	80.6	83.4	78.1	91.9	90.2	65.8	71.6	67.0
Number deaths under 1 year	109	115	147	118	129	129	145	130	97	102	95
Number live births	1,493	1,409	1,553	1,464	1,547	1,652	1,578	1,442	1,474	1,425	1,417

*The deaths of Indian children under one year of age and Indian births in Cattaraugus County have been excluded.

fall very close to the straight line, and it is doubtful that this line can be taken as representative of any real trend for the period as a whole. In fact, when the significance of the slope of the line is tested statistically, the slope (b in the equation) is found to be only three and a half times its probable error. It would seem very likely, therefore, that the trend of infant mortality in the County had been upward for this specific period, but it is not possible to determine accurately a definite rate of increase.*

Therefore, instead of comparing the infant mortality in 1924, 1925 and 1926 with the high point of 1923, or with an "expected rate" in those years based on a projection of the trend line for the preceding eight years, the more conservative comparison is made between the average rate for the eight years from 1916 to 1923, and the succeeding years. The difference between the average rate for the years 1916-1923, and the average rate for the years 1924-1926 was sixteen per 1,000 births, which is more than five times the probable error of the difference in the rates and undoubtedly indicates a significant change for the better in the infant mortality.

*The deaths under one year of age, but not the births, are available back to 1900. The infant death rates based on the total population of the County for the years 1900-1923 indicate an upward trend for this longer period, though the upward slope is less marked than for the eight years 1916-1923.

Table 2. Deaths of children under one year of age, per 1,000 live births (infant mortality) in Cattaraugus County, in Rural New York State, and in the Rural Birth Registration Area,* 1916-1926.

AREA	DEATHS UNDER ONE YEAR PER 1,000 LIVE BIRTHS										
	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Cattaraugus County	73.0	81.6	94.7	80.6	83.4	78.1	91.9	90.2	65.8	71.6	67.0
Rural New York State	83.1	85.4	92.8	76.9	78.2	73.7	74.2	76.9	67.5	66.8	73.1
Rural Birth Registration Area*	96.7	87.8	93.5	82.9	79.4	73.7	72.2	76.1	68.9	71.5	

*Area as of 1917, exclusive of Rhode Island, except for the year 1916.

Comparison of Cattaraugus County with Other Areas*

The second comparison is shown in Figs. 2 and 3 and in Table 2. Here, the trend of the infant mortality rate in Cattaraugus County during the eight-year period, 1916 to 1923, is compared with that in the rural area of New York State and that in the rural birth registration area of the United States, as of 1917.

The actual rates in the rural area of New York and in the rural birth registration area of the country show much less annual variation than Cattaraugus County due to the fact that they are average rates for many areas such as Cattaraugus County, in which the chance fluctuations compensate giving a more *stable* rate. The straight line trends fitted to these rates indicate a definite *downward* course and the slope of the lines in these larger areas is statistically significant. If "expected rates" for these two rural areas were computed by

*The sources of the data used in this study are as follows: the data for Cattaraugus County are taken from two sources—(1) special tabulations for the years 1916 to 1924, inclusive, made for the Milbank Memorial Fund from the records of the Division of Vital Statistics, New York State Department of Health; and (2) tabulation of duplicate death certificates for 1925 and 1926, now in the files of the Cattaraugus County Health Department.

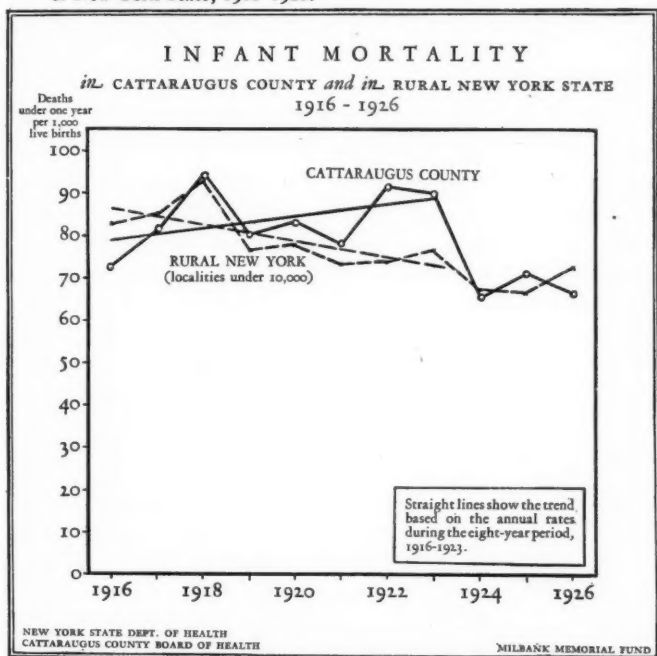
For other counties and for rural New York State, the data up to 1924 are from the annual reports of the Division of Vital Statistics. For the year 1925, a special manuscript table was supplied by the Division of Vital Statistics. For the year 1926 only the gross infant mortality rates were available, and these are provisional figures from the *Annual Supplement to the Monthly Vital Statistics Review*.

Statistics for the rural birth registration area of the United States are from the annual reports of the Census Bureau on Birth Statistics and Infant Mortality for the years 1916 to 1924. Figures for 1925 were furnished by the Census Bureau in manuscript, but for 1926 no data were available.

projecting the trend lines for the years following 1923, the rates so obtained would not vary greatly from the actual rates. In other words, the experience in these two large areas indicates a continuation of the same downward trend in 1924 and 1925, which had been in progress for the previous eight years. In Cattaraugus, however, a sharp decline occurred in 1924, and was maintained in 1925 and 1926. Whether this break is measured from an upward trend or from a level it seems to indicate a significant change in the rate.

A comparison of the annual infant mortality in Cattaraugus County with that in four other New York counties is

Fig. 2. Deaths of children under one year of age per 1,000 live births (infant mortality) in Cattaraugus County and in the rural areas of New York State, 1916-1926.



made in Table 3. The mortality in Chautauqua and Jefferson Counties shows a definite downward trend throughout the period, similar to that for rural New York State. The course of the mortality in Steuben and Washington has been very irregular and unlike that in Cattaraugus County or the other two counties. In these counties, the mortality from 1923 to 1926, inclusive, was less favorable than in the preceding years. The general level of the rates in all four counties in the three most recent years is very similar to that in Cattaraugus, but none show the same abrupt improvement.

*Important Causes of Infant Mortality in
Cattaraugus County*

The most important causes of mortality in the first year of life are (1) premature birth, (2) congenital defects and other conditions of early infancy, (3) injury at birth, (4) communicable diseases, (5) gastro-intestinal conditions and (6) respiratory diseases. The first three causes are subdivisions of the broad group of conditions classified by the International List of Causes of Death as "Malformations and Early Infancy." These six causes in nearly every year were responsible for approximately nine-tenths of all the infant deaths in Cattaraugus County. The percentage distribution of the infant deaths according to these important causes is shown in Table

Table 3. Deaths of children under one year of age, per 1,000 live births (infant mortality) in Cattaraugus County and in four other counties in New York State, 1916-1926.

COUNTY	DEATHS UNDER ONE YEAR PER 1,000 LIVE BIRTHS										
	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
Cattaraugus	73.0	81.6	94.7	80.6	83.4	78.1	91.9	90.2	65.8	71.6	67.0
Chautauqua	87.9	89.0	85.3	78.4	75.7	70.6	67.0	74.7	72.2	61.0	56.2
Jefferson	118.3	105.1	107.3	77.4	93.5	90.7	88.0	75.7	75.8	68.3	83.9
Steuben	78.2	81.9	96.4	67.7	65.4	65.7	60.1	94.9	67.6	67.9	83.0
Washington	86.8	107.3	112.3	65.3	75.3	64.1	75.3	87.9	72.0	77.2	86.3

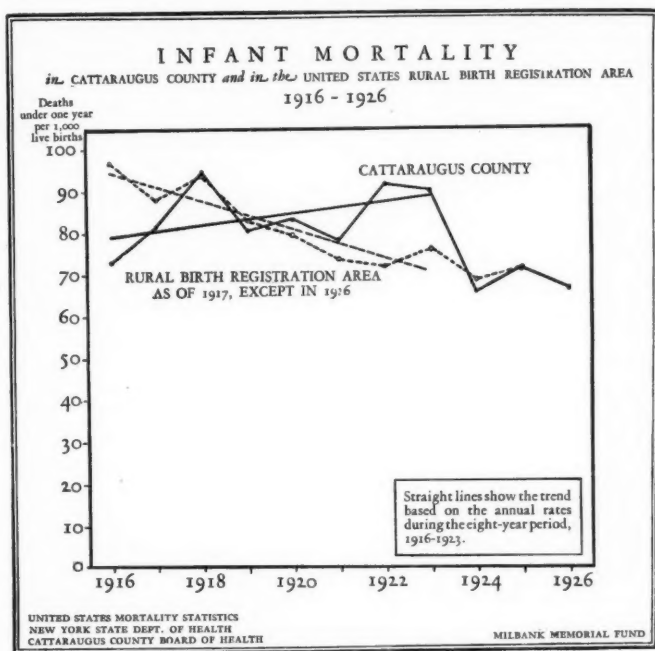


Fig. 3. Deaths of children under one year of age per 1,000 live births (infant mortality) in Cattaraugus County and in the rural birth registration area of the United States as of 1917, except in 1916, 1916-1926.

4, after the annual figures were combined into three periods of years. Since the number of deaths from specific causes in a single year is small and subject to wide fluctuation, the average numbers for several years give a more reliable picture.

Premature birth stands out as the most important cause of infant death in Cattaraugus County. In each of the three periods it was responsible for from 32 to 36 per cent of the total deaths. Malformations, debility and other congenital conditions caused approximately 18 per cent of the deaths in the periods 1916-1920, and 1921-1923, and 25 per cent in the period 1924-1926. Injury at birth added another 5 to 8 per

Table 4. Percentage distribution of deaths of children under one year of age (infant mortality) by important causes,* in Cattaraugus County, in three periods of years, 1916-1920, 1921-1923, and 1924-1926.

CAUSE* OF DEATH	PER CENT OF TOTAL		
	1916-1920	1921-1923	1924-1926
TOTAL	100.0	100.0	100.0
Communicable diseases (1-16)	5.0	3.5	3.4
Respiratory diseases and pulmonary tuberculosis (97-107, 31, 37a)	14.8	14.4	8.2
Gastro-intestinal diseases (112-113)	14.1	15.3	10.9
Malformations and early infancy (159, 160, 161, 162, 163)	56.2	56.4	69.4
Premature birth (161a)	33.4	31.7	35.7
Injury at birth (161b)	5.2	6.4	8.5
Congenital malformations, debility, and other infancy (159, 160, 162-163)	17.6	18.3	25.2
All other causes	9.9	10.4	8.2

*Numbers in parentheses refer to classifications in the International List, 1920 Revision.

cent to the mortality from the broad group of causes classed as "Malformations and Early Infancy." The total deaths from this general group was 56 per cent of all infant mortality in the first two periods of years and the large amount of 69 per cent in the latest period. Respiratory diseases and gastro-intestinal diseases were each, as a group, of about equal importance and were responsible for approximately 15 per cent of the total deaths during the years 1916-1920 and 1921-1923, but for the period 1924-1926, these groups caused 8 and 11 per cent respectively of the total deaths. Communicable diseases* in most years was not a very important cause of death, the average mortality from this cause for the three periods ranging from 3.5 to 5 per cent of the total.

The trend of the mortality from each group of causes in the County, except communicable diseases, is shown in Fig. 4 in which the annual rates shown in Table 5 have been plotted on a logarithmic ordinate scale. The five lines in this

*This group includes number 1 to 16, inclusive, of the International List, but in Cattaraugus from 1916 to 1926 deaths were reported only from measles, whooping cough, diphtheria and influenza.

Table 5. Deaths of children under one year of age (infant mortality), from important causes,* in Cattaraugus County, 1916-1926.

CAUSE* OF DEATH	DEATHS UNDER ONE YEAR PER 1,000 LIVE BIRTHS										
	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
All Causes	73.0	81.6	94.7	80.6	83.4	78.1	91.9	90.2	65.8	71.6	67.0
Communicable diseases (1-16)	2.7	0.7	5.8	2.0	10.3	1.8	1.9	5.5	3.4	1.4	2.1
Respiratory diseases (31, 37a, 97-107)	10.7	16.3	18.0	8.9	7.1	10.9	12.7	13.9	4.7	6.3	5.6
Gastro-intestinal diseases (112-113)	12.7	12.8	14.2	11.6	7.1	14.5	13.3	11.8	6.8	8.4	7.1
Malformations and early in- fancy (159-163)	42.9	41.2	47.6	46.4	53.0	43.0	53.9	49.9	43.4	49.1	49.4
Premature birth (161a)	30.8	27.7	29.0	25.3	25.2	27.2	27.2	27.7	22.4	25.3	25.4
Injury at birth (161b)	2.0	2.8	4.5	4.1	7.8	3.6	6.3	6.9	6.8	4.2	6.4
All other infancy (159, 160, 162-163)	10.0	10.6	14.2	17.1	20.0	12.1	20.3	15.3	14.2	19.6	17.6
All other causes	4.0	10.6	9.0	11.6	5.8	7.9	10.1	9.0	7.5	6.3	2.8

NUMBER OF DEATHS UNDER ONE YEAR											
All Causes	109	115	147	118	129	129	145	130	97	102	95
Communicable diseases (1-16)	4	1	9	3	16	3	3	8	5	2	3
Respiratory diseases (31, 37a, 97-107)	16	23	28	13	11	18	20	20	7	9	8
Gastro-intestinal diseases (112-113)	19	18	22	17	11	24	21	17	10	12	10
Malformations and early in- fancy (159-163)	64	58	74	68	82	71	85	72	64	70	70
Premature birth (161a)	40	39	45	37	39	45	43	40	33	36	36
Injury at birth (161b)	3	4	7	6	12	6	10	10	10	6	9
All other infancy (159, 160, 162-163)	15	15	22	25	31	20	32	22	21	28	25
All other causes	6	15	14	17	9	13	16	13	11	9	4

*Numbers in parentheses refer to classifications in the International List, 1920 Revision.

figure are strikingly different, and it is quite apparent that the mortality from some causes has increased during the eleven years from 1916 to 1926, while from others it has decreased. Deaths from premature birth show the least fluctuation but the logarithmic line indicates a slight downward trend. Other conditions of early infancy have shown just the opposite trend and the mortality both from injury at birth

and from congenital defects had a marked increase during the first five years of the period after which it seems to have remained approximately on a level, although wide fluctuations have occurred in some years.

When the trend of infant mortality from respiratory diseases and from gastro-intestinal conditions is considered a more encouraging outlook is obtained. The course of both groups for Cattaraugus County has been decidedly similar: the mortality from each group was high in 1917 and 1918, followed by a drop to quite a low rate in 1920, after which another high period of three years occurred and was succeeded by a decline in 1924, which lasted three years. With the exception of the low rate in 1920, mortality from gastro-intestinal diseases shows relatively small variations about a level for the years from 1916 to 1923, but that from respiratory diseases shows greater variation. The sharp decline in mortality in the three years 1924 to 1926, which was so marked in the death rate from all causes is found to be common to that from respiratory and gastro-intestinal diseases.

For a comparison of the percentage increase or decrease in the different causes, the average mortality in the last three years of the study has been compared with the average for the preceding three-year period which, in turn, has been compared with the five-year period 1916-1920. The mean rates and the percentage change are shown in Table 6.

The mean infant mortality rate in Cattaraugus County for the three years 1921-1923 was approximately 5 per cent higher than for the five years 1916-1920. Each of the major causes showed some increase, except premature birth, which remained the same, and communicable diseases which showed a decrease.* The increase in infant mortality from respiratory diseases was not significant being only 2 per cent.

*When deaths from influenza are excluded from the communicable disease group the mortality in the two periods is nearly constant, being 2.3 per 1,000 live births in the first period and 2.1 in the second.

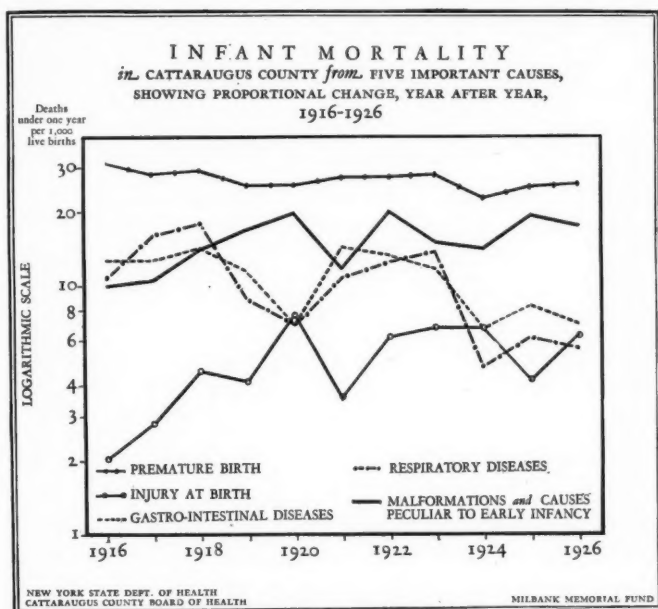


Fig. 4. Deaths of children under one year of age per 1,000 live births (infant mortality) in Cattaraugus County from five important causes, showing proportional change, year after year, 1916-1926.

The increase in the mortality from gastro-intestinal diseases, from malformations and other congenital conditions and from "all other causes" ranged from 10 to 14 per cent. Deaths from injury at birth increased 30 per cent, but this figure is based on a small number of deaths.

The abrupt decline in the three latest years (1924-1926) brought the mean infant mortality from all causes in the County a little more than 20 per cent lower than the mean mortality in the preceding three-year period. It is interesting to note that the decline in the mortality from specific causes bears no relation to the increase that had occurred in the previous years. Thus, deaths from injury at birth showed a

Table 6. Per cent of change in deaths of children under one year of age (infant mortality), from important causes,* in Cattaraugus County, in the three-year periods, 1921-1923 and 1924-1926, over the average rates for a preceding period.

CAUSE* OF DEATH	RATE PER 1,000			PERCENTAGE CHANGE	
	1916-20	1921-23	1924-26	1921-23 OVER 1916-20	1924-26 OVER 1921-23
TOTAL	82.51	86.47	68.12	+ 4.8	-21.2
Communicable diseases (1-16)	4.15	3.00	2.32	-27.7	-22.7
Respiratory diseases (97-107, 31, 37a)	12.19	12.41	5.56	+ 1.8	-55.2
Gastro-intestinal diseases (112-113)	11.65	13.27	7.41	+13.9	-44.2
Malformations and early infancy (159-163)	46.34	48.80	47.27	+ 5.3	- 3.1
Premature birth (161a)	27.59	27.40	24.33	- 0.7	-11.2
Injuries at birth (161b)	4.29	5.57	5.79	+29.8	+ 3.9
Congenital malformations, debility and other infancy (159, 160, 162, 163)	14.47	15.84	17.14	+10.94	+ 8.2
All other causes	8.17	8.99	5.56	+10.0	-38.2

*Numbers in parentheses refer to classifications in the International List, 1920 Revision.

further slight increase, and the deaths from malformations, debility and other conditions of early infancy increased 8 per cent. Deaths from premature birth, which had not increased in the former period declined 11 per cent. The most significant decrease was in the deaths from gastro-intestinal and respiratory diseases which declined 44 and 55 per cent.

Of the specific causes considered separately in the above tables and discussion, three are recognized as largely preventable. Deaths from communicable diseases, the respiratory diseases and from gastro-intestinal diseases should be very rare if modern knowledge of sanitation, control of diseases and infant care were utilized to the fullest extent by individual families and health departments. It is, therefore, extremely encouraging to find that the infant deaths from these three groups of causes in Cattaraugus County in the years 1924 to 1926 was 15.3 per 1,000 live births against 28.7 in the preceding three-year period, a decline of 47 per cent in the mortal-

ity rate and a saving of thirteen infant lives out of each one thousand born alive.

In marked contrast is the very slight decline which has occurred in the mortality due to congenital defects and conditions at birth. These causes obviously are associated with heredity and prenatal conditions for the prevention of which specific activities are not as yet well defined. The mean mortality in the period 1924-1926 from these causes was 47.3 per 1,000 live births against 48.8 in the preceding three-year period, a decline of only 3 per cent and a saving of only three infants out of each two thousand born alive. These congenital and early infancy conditions offer a very difficult and complex problem which is a challenge to any health department.

*Important Causes of Infant Mortality in Four
Other New York Counties*

Only the mean infant mortality from certain important causes for the first five years was available for counties other than Cattaraugus. These rates are shown in Table 7. The annual deaths from 1921 to 1925 were available but these have been combined into two periods, and the mean rate for the three years 1921 to 1923, and for two years 1924 to 1925, are shown in the same table with corresponding rates for Cattaraugus County. Although these unequal time periods are not ideal they give a satisfactory basis for several interesting and probably significant comparisons. To set forth more clearly the relative mortality in the different counties the ratios of the mortality rates in the several counties from each cause and in each period to the corresponding rate in Cattaraugus County are shown in the table.

Considering first the earliest period, we find that the mean infant mortality in Cattaraugus County from each of these causes except premature birth was approximately the same or lower than in the other counties with the exception that

Table 7. Deaths of children under one year of age (infant mortality), from important causes,* in Cattaraugus County, compared with four other counties in New York State in three different time periods from 1916 to 1925.

COUNTY	Deaths Under 1 Year Per 1,000 Live Births			Ratio of Rates in Other Counties to Cattaraugus Rates†		
	1916-1920	1921-1923	1924-1925	1916-1920	1921-1923	1924-1925
Total Under 1 Year						
Cattaraugus	82.8	86.5	68.6	1.00	1.00	1.00
Chautauqua	83.4	70.8	66.7	1.01	.82	.97
Jefferson	100.1	84.9	72.0	1.21	.98	1.05
Steuben	78.1	73.0	67.7	.94	.84	.99
Washington	89.7	75.8	74.5	1.08	.88	1.09
Communicable Diseases (1-16)						
Cattaraugus	4.4	3.0	2.4	1.00	1.00	1.00
Chautauqua	6.7	5.0	2.7	1.52	1.66	1.12
Jefferson	7.7	5.2	2.9	1.75	1.73	1.19
Steuben	6.8	4.1	3.7	1.55	1.37	1.52
Washington	7.1	2.3	3.9	1.61	.78	1.61
Respiratory Diseases (31, 37a, 97-107)						
Cattaraugus	12.2	12.4	5.5	1.00	1.00	1.00
Chautauqua	11.7	9.3	9.1	.96	.75	1.65
Jefferson	13.0	11.0	6.9	1.07	.88	1.24
Steuben	8.7	10.0	7.3	.71	.80	1.33
Washington	16.5	8.6	9.5	1.35	.69	1.71
Gastro-Intestinal Diseases (112-113)						
Cattaraugus	11.7	13.3	7.6	1.00	1.00	1.00
Chautauqua	15.0	9.3	8.1	1.28	.70	1.06
Jefferson	16.0	11.1	7.7	1.37	.84	1.02
Steuben	9.9	10.3	11.6	.85	.78	1.53
Washington	15.3	10.9	12.2	1.31	.82	1.61
Premature Birth (161a)						
Cattaraugus	27.6	27.4	23.8	1.00	1.00	1.00
Chautauqua	20.8	20.9	17.6	.75	.76	.74
Jefferson	25.5	20.6	21.1	.92	.75	.89
Steuben	21.1	18.7	18.9	.76	.68	.79
Washington	23.6	23.3	21.7	.86	.85	.91
Congenital Malformations, Debility and Other Infancy (159-160, 161b, 162-3)						
Cattaraugus	18.8	21.4	22.4	1.00	1.00	1.00
Chautauqua	21.3	20.0	20.3	1.13	.94	.90
Jefferson	24.9	25.3	22.3	1.32	1.18	.99
Steuben	23.6	21.5	20.1	1.26	1.00	.90
Washington	17.7	19.0	20.0	.94	.89	.89
All Other Causes						
Cattaraugus	8.2	9.0	6.9	1.00	1.00	1.00
Chautauqua	7.9	6.3	8.9	.96	.70	1.29
Jefferson	13.0	11.7	11.1	1.59	1.30	1.61
Steuben	8.1	8.4	6.1	.99	.93	.88
Washington	9.4	11.7	7.2	1.15	1.30	1.05

*Numbers in parentheses refer to classifications in the International List, 1920 Revision.

†Ratios are computed on rates to two decimals.

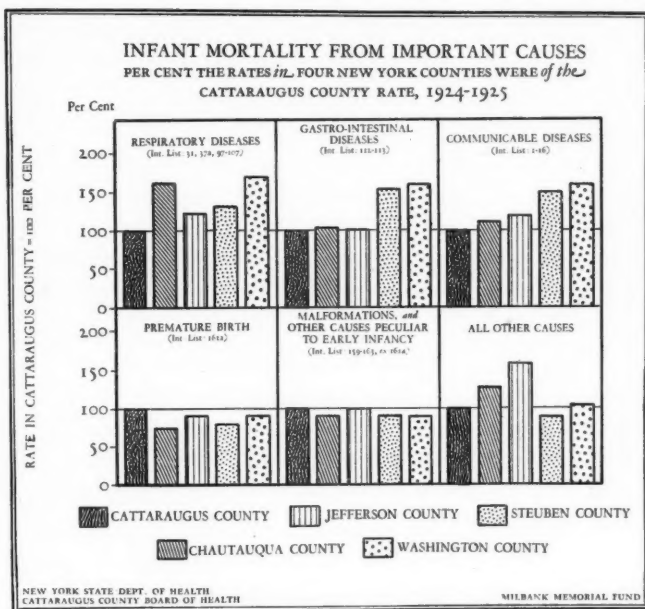


Fig. 5. Deaths from important causes of children under one year of age per 1,000 live births (infant mortality). Per cent the rates in four New York Counties were of the Cattaraugus County rate, 1924-1925.

the mortality from both respiratory and gastro-intestinal diseases was lower in Steuben County than in Cattaraugus. The mortality from premature birth, on the other hand, was 8 to 25 per cent lower in each of the other counties than in Cattaraugus. The excess infant mortality in Chautauqua, Jefferson and Washington Counties as compared with Cattaraugus County was greatest in deaths due to gastro-intestinal diseases and to communicable diseases.

In the period 1921-1923, when the mortality from most causes had increased in Cattaraugus County, the death rate from each cause except communicable diseases was considerably lower in at least two and in some instances all of the

other counties of comparison than in Cattaraugus County. The deaths due to respiratory and gastro-intestinal diseases and from premature births were from 12 to 30 per cent lower in each of the other counties than in Cattaraugus.

The relative mortality from the various causes in the two years 1924 and 1925 in the four other counties and in Cattaraugus is shown graphically in Fig. 5. The average mortality from all causes was fairly similar in all these counties, being only 3 per cent and 1 per cent lower in Chautauqua and Steuben respectively than in Cattaraugus, and 5 and 9 per cent higher in Jefferson and Washington Counties. The mortality from specific causes, however, was very different in these counties. Mortality in the four counties due to premature birth was from 9 to 26 per cent lower than in Cattaraugus County. In three of the four counties, the death rate from congenital defects and other conditions of infancy was 10 per cent under that in Cattaraugus. On the other hand, the mortality from each of the three groups of "preventable" diseases was lower in Cattaraugus than in any of the other counties; the greatest difference is shown in the mortality from respiratory diseases.

Conclusion

It is not the purpose of this inquiry to seek to determine how much, if any, of the recent decline in the death rate of Cattaraugus County infants has been due to a recent increase in the County's public health work. Since 1923, the County has been participating in a health demonstration, the chief task of which has been the building up of the services of its County Board of Health and its County School Health Service, both newly established in that year. As a part of this program, specific activities for the protection of the health of infants have been gradually developed. No special bureau for work in infant and maternal hygiene was

established until the summer of 1926, but considerable direct work for the protection of infants was carried on by the public health nurses as part of the generalized nursing service, inaugurated in 1923. During the first two years of the operation of this service, the nurses visited only special cases for which care was sought or which were discovered through the various activities of the Board of Health. In October, 1925, however, routine visiting of all new-born infants was started. The comparison made in the accompanying table of the nurses' home visits in successive years is, therefore, indicative of an increase in the growth of the County's work for the conservation of the health of its infants. Mothers' Health Clubs for group study had been organized as early as 1924, but intensive prenatal care was not developed until 1926, when the bureau of maternity, infancy and child hygiene was established under a medical director.

It may be presumed, however, that such activities, accompanied by others included in a general public health program, may have affected the health of the infants in the County. But the fact that a decline in the deaths of infants took place at this time does not establish what factors brought about this decline. And, as I have pointed out, it is not within the province of this study to establish a relationship between any specific conditions or activities in the County and a lowered mortality.

To sum up the more important indications revealed by this analysis, however, the reduction in deaths which occurred in the last three years was almost wholly the result of a decrease in the deaths from communicable diseases, respiratory

Type of Service	Number of Nurses Home Visits*			
	1923	1924	1925	1926
Prenatal and maternity	25(1)	1,208	1,739	1,738
Infant hygiene (under 2 years)	460(2)	1,829	3,800	4,492

(1) Prenatal visits only.

(2) Includes all visits to children of pre-school age.

*Does not include visits made by Olean City nurses.

and gastro-intestinal diseases, the death rate from these preventable causes in the period 1924-1926 being approximately 50 per cent of the rate in the preceding three-year period and well below the rate in the four other counties in the years 1924-1925. Although the death rate from premature birth declined 11 per cent in the three-year period 1924-1926, it exceeded that in the four counties. Furthermore, the mortality from congenital defects and other conditions peculiar to early infancy increased and it also was higher than in three of the four counties. More than two-thirds of all infant deaths in the period 1924-1926 were attributed to the causes classified as "Malformations and Early Infancy." These causes obviously are a very important problem in Cattaraugus with reference to its infant hygiene work. Even though the decline in deaths from the preventable causes continues, it will have an increasingly slight effect on the gross infant mortality and the reduction in the infant mortality will be limited unless the mortality from these early infancy conditions also can be reduced.



NEWS DIGEST

of the NEW YORK HEALTH DEMONSTRATIONS

IN his message to the New York State Legislature on January 4, 1928, Governor Alfred E. Smith again stressed the advantages of the county as a unit for the administration of public health work. Sketching briefly the history and present status of local public health administration in New York State he urged other counties to follow the example of Cattaraugus and avail themselves of the financial aid which the State has provided for the maintenance of public health programs under local auspices and under the direction of full-time local health officers.

An "important public health statute enacted in 1921 permits the establishment of county health departments," Governor Smith reminded the Legislature. "Our knowledge of preventive medicine has reached the point where for best results its administration should be in the hands of a qualified full-

time expert in this field. Towns and villages with but few exceptions cannot afford such service. So far but one county in the State (Cattaraugus) has taken advantage of this law, but others are giving it serious consideration, and it is to be hoped that the time is not far off when local health administration throughout the State may be in the hands of full-time qualified county health officers.

"New York is a laggard in this respect. In the entire country there were on January 1, 1927, 337 county health departments, one state alone having forty-seven.

"It must be borne in mind that for thoroughly effective health work the State must have the full cooperation of the localities. The counties should do their share. The State stands ready to give financial and other aid, but unless there is a live, local interest in the public health problem the desired

progress is difficult to make.

"We have proved the slogan of the late Hermann M. Biggs, State Commissioner of Health in my first and part of my second administration, who was probably the foremost authority on the subject of public health in this country. He said, '*Within natural limits, public health is purchasable.*' The history of the last ten years of the State Health Department and its statistics prove the soundness of this theory."



DURING the past five years the death rate from tuberculosis in Cattaraugus County has declined approximately one-third. The significance of this decline will be discussed by Edgar Sydenstricker in the April *Quarterly Bulletin*. The article is one outcome of studies which Mr. Sydenstricker and his staff are making

of the vital statistics of Cattaraugus County and Syracuse. These studies include researches into: (1) the effect of non-resident births upon the birth rate of Cattaraugus County; (2) the effect of the inclusion of non-resident deaths on the infant mortality rates of Cattaraugus County, 1921-1927; (3) natality in Cattaraugus County, 1916-1927; (4) infant mortality in Cattaraugus County, 1916-1927; (5) maternal mortality from specific causes in Cattaraugus County, 1916-1927; (6) tuberculosis mortality in Cattaraugus County, 1916-1927; (7) the use of school medical examiners' records in measuring results of pre-school and school health work; (8) a study of measles epidemics in Syracuse, 1916-1927; and (9) the incidence of communicable diseases by age and sex in Syracuse 1917-1927.



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